ROYAL ASTRONOMICAL SOCIETY.

VOL. X. *April* 12, 1850. No. 6.

G. B. AIRY, Esq., President, in the Chair.

W. S. Downes, Esq., Prestbury Villas;
O. G. Downes, Esq., Highbury Grove; and
Rev. Charles Lowndes, Hartwell Rectory, Bucks;
were balloted for and duly elected Fellows of the Society.

Professor Benjamin Pierce;
Dr. A. D. Bache;
Professor O. M. Mitchell; and
Sears C. Walker, Esq.;
all of the United States of America, were balloted for and duly elected Associates of the Society.

See the last page for the notice of a new comet.

HEBE.

LIVERPOOL. Equatoreal. (Mr. Hartnup.)

1850.	Greenwich M.T.	R.A.	N.P.D.	Compd.—Obsd. R.A.	Compd.—Obsd. N.P.D.	Stars of Comp.
	h m s	h m s	° ′ ″	s	″	
Mar. 16	12 48 26·7	13 17 29·79	80 0 59·6	−0·86	−1·8	59 Virginis.
17	10 43 15·3	16 51·79	79 52 13·4	0·81	1·8	—
18	11 5 27·4	16 8·70	42 30·7	0·87	2·2	—
21	12 31 9·6	13 53·18	79 13 36·1	0·88	3·0	—
24	10 40 20·3	11 37·04	78 46 36·2	1·02	1·8	ε Virginis.
26	11 50 37·8	9 58·02	28 10·4	0·78	0·8	—
27	10 46 3·7	9 11·34	19 45·7	0·96	1·4	—
28	13 21 49·3	8 16·30	78 10 10·1	0·84	3·6	—
31	10 53 56·0	5 50·21	77 45 45·2	0·71	2·3	—
April 5	10 40 31·7	13 1 34·13	77 6 49·6	0·83	2·5	—
12	10 34 27·7	12 55 36·41	76 20 7·3	−0·95	−0·5	4423 B.A.C.

The observations are corrected for refraction and parallax. The computed places were deduced from the Supplement to the *Nautical Almanac* for 1853. The following assumed places of the stars of comparison are derived from the *Edinburgh Observations*:—

For January 1, 1850.

	Mean R.A.	Mean N.P.D.
	h m s	° ′ ″
59 Virginis	13 9 19·87	79 47 24·62
ε Virginis	12 54 42·68	78 13 58·34
4423 B.A.C.	13 5 5·17	77 38 39·11

By C. Rümker.

1850.	Hamburg M.T. h m s	App. R.A. ° ′ ″	App. Decl. ° ′ ″	
Feb. 22	11 41 57·6	201 55 2·6	+6 32 36·3	Equatoreal.
Mar. 8	16 37 22·1	200 34 56·1	8 42 51·2	—
9	10 25 37·5	28 51·4	8 49 57·9	—
11	9 30 40·4	200 12 2·6	9 8 57·5	—
15	10 35 6·2	199 33 47·6	9 48 2·3	—
30	8 20 15·3	196 42 1·0	12 4 42·1	—
31	8 45 59·5	29 4·7	13 13·8	—
April 1	8 18 44·0	196 16 32·1	21 10·1	—
3	9 58 54·0	195 50 5·3	12 37 30·4	—
8	10 47 52·0	194 45 9·1	13 14 16·9	—
11	9 52 15·1	194 7 20·5	33 25·5	—
15	10 31 34·5	193 17 14·5	13 56 25·7	—
16	10 27 43·9	193 5 7·8	14 1 33·6	—
17	9 6 47·4	192 53 46·5	6 16·6	—
17	11 8 45·4	52 40·9	6 38·2	Mer. Circle.
18	11 4 2·5	40 55·9	11 20·7	—
19	10 59 21·8	192 29 38·4	+14 15 55·7	—

The position of *Hebe*, April 1, rests on a transit of the planet over a fixed star, the light of the latter eclipsing that of the planet so completely, that their places may be considered very nearly as identical.

Mean Places for January 1, 1850, of Stars in the Orbit of Hebe, deduced from Observations with the Meridian Circle.

Mag.	Mean R.A. h m s	Mean Dec. ° ′ ″	Day of Comparison with Hebe.
7·8	12 40 19·425	+14 14 37·9	
7	12 40 43·366	14 22 22·6	
8	12 45 51·560	14 9 31·3	
7	12 53 55·516	13 58 36·9	April 11, 15, 16, 17
9	12 54 13·797	13 58 59·3	
9	13 0 0·238	13 7 44·0	April 8
9	13 0 5·817	13 4 32·1	
9	13 0 37·024	12 59 58·1	
7	13 5 4·898	12 21 16·6	April 1 and 3
7	13 7 2·245	12 7 44·2	March 30, 31
9	13 12 25·939	11 16 40·6	
9	13 18 54·318	9 41 25·9	March 15
9	13 23 54·101	8 49 49·1	March 9
7	13 25 35·916	+6 37 24·7	Feb. 22

HYGEIA.

MARKREE. Equatoreal. (E. J. Cooper, Esq., and A. Graham.)

1849.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″	Stars of Comparison.	Relative Weights.
May 26	11 17 18·9	12 2 24·84	95 30 3·7	*a*	12
29	11 49 25·6	3 12·84	29 52·6	*a*	30
31	12 6 2·2	3 51·25	30 42·0	*a*	30
June 5	11 53 48·9	5 47·13	34 59·2	*a*	12
6	11 5 50·8	6 12·07	36 3·8	*a*	20
7	10 55 58·8	6 39·78	37 28·1	*b*	20
8	11 1 23·6	7 8·74	38 45·1	*b*	15
9	11 45 22·3	7 40·65	40 34·2	*c*	12
12	11 5 26·4	12 9 15·52	95 45 53·9	*d*	20

Corrected for Parallax.

Mean Places of stars, 1849·0.

	h m s	° ′ ″	
a	12 3 23·87	95 42 37·9	Weisse 35
b	12 6 54·22	95 50 25·1	,, 100
c	12 10 10·03	95 35 16·4	,, 153
d	12 10 59·23	95 40 4·4	,, 168

May 31. Very faint.
June 5. Excessively difficult. Strong moonlight.
7. Observation not good.

BERLIN. (Prof. Encke and Dr. Galle.)

1850.	Berlin M.T. h m s	R.A. ° ′ ″	Dec. ° ′
Mar. 14	16 46 18	284 22 7·1	−24 16
15	16 53 4	284 41 19·1	−24 14
17	16 44 38	285 18 49·0	−24 8

Extract of a Letter from M. d'Arrest to Sir J. F. W. Herschel, Bart.

"The new planet *Hygeia* having been found again by Dr. Galle on the 14th of March, emerging from the morning twilight as a star of the 12th magnitude, I have applied corrections to the orbit, insufficiently known by the observations of the first period of visibility.

"I therefore take the liberty to present to you, by this letter, my elements No. V., together with an ephemeris, which may perhaps prove useful to English observers, no other computations having been published, as I believe, relating to this planet. The ephemeris I have given in Encke's *Year-Book* for 1852 is to be laid aside, as based on my elements No. II."

Elements of Hygeia, No. V.

1849, April 15, 0^h, Berlin M.T.

Mean longitude	198° 7′ 34″·98	Mean Equinox, 1849, Jan. 0.
Long. of perihelion	226 39 53·89	
Long. of the asc. node ...	287 55 39·11	
Inclination	3 46 59·12	
Angle of excentricity.....	5 23 22·64	
Log. *a*.....	0·4944079	
Excentricity	0·0939280	
Mean daily motion	643″·2723	(sider.)
Sider. period	2014·7	Mean solar days.

Ephemeris of Hygeia, for Berlin Mean Midnight.

	R.A.	Decl.	Log. Dist.	Log. *r*.
	° ′ ″	° ′ ″		
April 2	289 45 56·0	−23 33 50·4	0·44772	0·46089
4	290 15 40·7	23 29 15·2	0·44369	
6	290 44 25·6	23 24 41·2	0·43962	0·46126
8	291 12 9·4	23 20 8·4	0·43551	
10	291 38 49·9	23 15 38·4	0·43136	0·46163
12	292 4 25·4	23 11 12·0	0·42717	
14	292 28 54·0	23 6 50·1	0·42295	0·46200
16	292 52 14·3	23 2 32·6	0·41870	
18	293 14 24·1	22 58 19·8	0·41442	0·46239
20	293 35 24·1	22 54 12·1	0·41012	
22	293 55 13·8	22 50 12·0	0·40580	0·46278
24	294 13 50·2	22 46 18·3	0·40146	
26	294 31 9·7	22 42 32·1	0·39712	0·46317
28	294 47 13·3	22 38 54·1	0·39276	
30	295 1 59·8	22 35 24·6	0·38839	0·46357
May 2	295 15 26·7	22 32 4·3	0·38402	
4	295 27 32·3	22 28 54·0	0·37966	0·46397
6	295 38 15·2	22 25 54·0	0·37531	
8	295 47 33·3	22 23 4·7	0·37097	0·46438
10	295 55 26·0	22 20 26·4	0·36666	
12	296 1 51·8	22 17 59·4	0·36238	0·46479
14	296 6 50·3	22 15 44·3	0·35813	
16	296 10 20·9	22 13 40·7	0·35393	0·46521
18	296 12 23·3	22 11 49·0	0·34979	
20	296 12 56·6	22 10 9·5	0·34570	0·46563
22	296 12 0·8	22 8 42·1	0·34167	
24	296 9 35·9	22 7 26·7	0·33772	0·46606
26	296 5 41·9	22 6 23·5	0·33386	
28	296 0 18·6	22 5 31·8	0·33010	0·46649
30	295 53 25·8	−22 4 51·5	0·32643	

	R.A.	Decl.	Log. Dist.	Log. *r*.
	° ′ ″	° ′ ″		
June 1	295 45 4·3	−22 4 22·2	0·32287	0·46693
3	295 35 15·6	22 4 4·2	0·31943	
5	295 24 1·9	22 3 56·2	0·31613	0·46737
7	295 11 24·3	22 3 58·5	0·31297	
9	294 57 25·5	22 4 10·3	0·30994	0·46781
11	294 42 6·8	22 4 30·5	0·30708	
13	294 25 31·6	22 4 58·3	0·30441	0·46826
15	294 7 44·2	22 5 33·1	0·30192	
17	293 48 49·3	22 6 13·9	0·29960	0·46871
19	293 28 51·2	22 6 59·7	0·29748	
21	293 7 53·2	22 7 50·0	0·29555	0·46916
23	292 45 58·9	22 8 43·3	0·29384	
25	292 23 14·2	22 9 39·5	0·29235	0·46962
27	291 59 45·0	22 10 37·4	0·29108	
29	291 35 38·4	22 11 36·0	0·29005	0·47008
July 1	291 10 57·8	22 12 34·3	0·28926	
3	290 45 49·9	22 13 31·5	0·28871	0·47055
5	290 20 21·9	22 14 26·8	0·28840	
7	289 54 41·0	22 15 19·5	0·28833	0·47102
9	289 28 52·0	22 16 8·9	0·28851	
11	289 3 2·1	22 16 54·5	0·28893	0·47149
13	288 37 21·0	22 17 35·8	0·28960	
15	288 11 55·3	22 18 11·7	0·29051	0·47197
17	287 46 50·6	22 18 41·7	0·29167	
19	287 22 13·9	22 19 6·2	0·29306	0·47244
21	286 48 10·0	22 19 24·6	0·29469	
23	286 24 45·8	22 19 37·0	0·29655	0·47292
25	286 2 6·6	22 19 42·8	0·29863	
27	285 50 18·9	22 19 42·2	0·30092	0·47341
29	285 29 28·4	22 19 35·1	0·30342	
31	285 9 41·1	−22 19 21·7	0·30611	0·47390

Reckoned from the apparent equinox.

NEPTUNE.

MARKREE. Meridian Circle. (E. J. Cooper, Esq., and A. Graham.)

1849.	Greenwich M.T.	R.A.	N.P.D.	No. of Wires.
	h m s	h m s	° ′ ″	
Oct. 13	9 22 41·3	22 18 8·26	101 20 58·1	7
29	8 19 2·5	17 23·84	25 1·2	7
30	15 4·8	17 22·03	25 10·5	7
Nov. 2	8 3 12·2	17 17·15	25 34·0	7
13	7 19 49·8	17 9·77	26 5·8	7
Dec. 4	5 57 45·0	22 17 39·11	101 23 3·0	7

Corrected for parallax.

Lassell's Satellite of Neptune.

Observations by Mr. Lassell, with the 20-foot Equatoreal Reflector, Power 366.

	Greenwich M.T.	Position.	Distance.	Obs.
1849.	h m s	° ′	″	
Nov. 15	6 56 40·7		17·45	4
	7 34 58·0	219 57		5
Dec. 6	6 35 25·7	45 2		5

Nov. 15. Measures of distance difficult.
Dec. 6. Sky brilliant, but definition bad; no satisfactory measure of distance could be taken.

ASTRÆA.

LIVERPOOL. Equatoreal. (Mr. Hartnup.)

	Greenwich M.T.	R.A.	N.P.D.	Stars of Comp.
1850.	h m s	h m s	° ′ ″	
March 16	8 4 23·8	3 58 29·94	73 35 25·9	γ Tauri
	8 34 17·1	32·06	14·1	—
18	8 39 42·2	4 1 52·05	73 21 35·7	δ Tauri
	9 9 40·6	54·22	26·4	—

The observations are corrected for refraction and parallax. The following assumed places of the stars of comparison are derived from the *Greenwich Observations*.

For January 1, 1850.

	Mean R.A.	Mean N.P.D.
	h m s	° ′ ″
γ Tauri	4 11 15·71	74 44 21·14
δ Tauri	4 14 17·35	72 48 50·45

METIS.

MARKREE. Equatoreal. (E. J. Cooper, Esq., and A. Graham.)

	Greenwich M.T.	R.A.	N.P.D.	Stars of Comparison.	Relative Weights.
1849.	h m s	h m s	° ′ ″		
June 19	14 7 36·1	22 39 22·60	105 37 52·7	*a*, *b*, *c*	18
26	13 32 28·6	22 42 20·77	105 45 8·5	*d*	15
July 11	13 19 19·0	22 44 42·24	106 26 8·9	*e*	20
12	13 18 24·5	22 44 39·00	106 30 6·1	*e*	40
Sept. 6	11 56 0·3	22 5 47·36	111 45 44·0	*f*	30
1850.					
Jan. 15	6 42 12·5	23 28 41·99	97 42 1·4	*g*	30
16	6 51 49·4	23 30 19·09	97 29 41·4	*h*	20

Mean Places of stars, 1849·0

	h	m	s	°	′	″	
a	22	36	14·60	105	24	8·4	Merid. Circle, 1 Obs.
b	22	36	18·72	105	27	57·4	,, 1
c	22	36	55·15	105	35	28·3	,, 1
d	22	42	31·92	105	31	45·1	,, 2
e	22	46	37·91	106	37	20·0	B.A.C. 7980
f	22	5	57·28	111	49	21·6	B.A.C. 7751. Took this.
			57·03			20·5	Merid. Circle, 5 Obs.

Mean Places of stars, 1850·0

g	23	28	33·91	97	56	47·0	Weisse 592
h	23	33	26·35	97	18	32·3	Weisse 693

Meridian Circle.

1849.		Greenwich M.T. h	m	s	R.A. h	m	s	N.P.D. °	′	″	No. of Wires.
Aug.	3	14	19	57·6	22	36	16·09	108	31	24·2	5
Sept.	3	11	50	23·4		8	32·91	111	34	29·3	7
	4		45	32·0		7	36·89		38	25·1	6
	5		41	8·3		6	41·97		42	12·6	2
	7		31	1·9		4	54·07	111	49	10·9	7
	11	11	11	54·3	22	1	29·58	112	0	33·8	7
	14	10	57	45·6	21	59	8·14		6	55·4	7
	17		43	43·7		56	59·02		11	16·0	6
	18		39	12·9		56	18·63		12	23·5	7
	19		34	38·1		55	39·67		13	12·7	7
	20	10	30	5·2		55	2·55		13	57·7	7
Oct.	1	9	41	55·6		50	7·09	112	7	16·5	7
	5		25	19·0		49	13·96	111	59	3·3	7
	8		13	10·9		48	53·54		50	58·7	7
	10	9	5	14·7		48	49·13	111	44	45·2	7
	29	7	55	47·3		54	4·88	110	14	52·6	7
	30		52	24·6		54	38·11	110	8	48·1	7
Nov.	2		42	7·2	21	56	26·53	109	49	50·2	3
	13	7	7	34·3	22	4	52·28	108	31	27·4	7
	23	6	38	2·1		14	40·75	107	9	24·6	7
	24		35	10·7		15	45·44	107	0	40·1	7
Dec.	4	6	7	27·8	22	27	23·55	105	28	42·8	5

August 3. Very faint. Bisection not good.
Sept. 17. This observation cannot be depended on. Wires too strongly illuminated.
Oct. 5. Horizontal wires not distinct. Transits well taken.
10. Extremely faint. The transits were little better than guesses.
29. Extremely faint.
30. Extremely faint.
Nov. 2. Extremely faint. Little better than guesses.
13. Faint, but well taken.
23. Extremely faint.
24. Very faint.
Dec. 4. Extremely faint.

All these places are corrected for parallax.

IRIS.

LIVERPOOL. Equatoreal. (Mr. Hartnup.)

1850.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″	Star of Comp.
May 1	12 31 5·0	15 47 26·83	113 41 4·5	*a*
	13 10 58·0	15 47 25·26	113 41 2·6	*b*

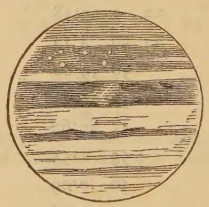
"The observations are corrected for refraction and parallax. The following are the assumed *apparent* places of the stars of comparison.

	R.A. h m s	N.P.D. ° ′ ″
a	15 45 2·68	113 31 31·1
b	15 41 59·81	115 17 24·9

"The mean place of *a* was taken from the *Greenwich Twelve-year Catalogue*, and of *b* from the B.A.C.

"The planet appeared to me to shine as a star of about the 9th magnitude."

Sketch of Jupiter, as seen on the 27th March, 1850, *at* $11^h\ 11^m{\cdot}0$ *G.M.T.* By Mr. Lassell. With his 20-foot Equatoreal Reflector, 24 inches' aperture, power 430.



"In this sketch I have attempted to delineate the phenomena of the disk of *Jupiter*, seen with the 20-foot equatoreal, power 430, 24 inches' aperture. The *white spots* are most remarkable.* The principal spot is exactly half way over at $11^h{\cdot}0$. They are all perfectly round, distinct, and bright. The largest is as plain as I have seen with the 9-foot, the disk of a satellite just entered within the limb, and as well defined. They are striking phenomena.

"$11^h\ 20^m$. The spots keep their relative positions, as they are carried along by *Jupiter's* rotation; and there are no other similar spots anywhere on the disk. I tried 22 and 20 inches' aperture, but there was no improvement of definition."

Extract of a Letter from Mr. Norman Pogson.

"No orbit has, I believe, yet been computed of the comet of Pons, observed at Marseilles in 1818: indeed, the four observations

* A wood-cut cannot render the shading of *Jupiter's* body satisfactorily, but the position and approximate size and appearance of the *white spots* give a fair idea of Mr. Lassell's sketch. After the evening meeting, Mr. Dawes said that he had seen the same appearance, which bears some resemblance, at first sight, to the craters in the moon.

taken were not very tempting ones for such a purpose. Mr. Hind has, however, deduced three places from them. They are as below:—

	Berlin M.T.	R.A.	Decl.
		° ′	° ′
1818.	Feb. 23·312	31 12	−15 12
	25·312	34 43	16 43
	27·312	38 14	−18 16

"From *these* places, as a first approximation, I have observed the following elements:—

T	Feb. 7·434	Berlin M. T.
☊	250°4′·0	
ϖ	95 7·0	
I.	20 2·4	
Log. q	9·86526	Motion direct.

"As the original observations were involved in a little mystery from some supposed errors, Mr. Hind says he will enter more fully on the subject, when the *corrected* elements are finished, which shall be as early as I can possibly find time for. The elements are almost identical with those of a comet which appeared in 1772, supposed to have been the comet of Biela. Probably it will prove an apparition of that body. I will work out two orbits, and take the mean, as there are four observations."

Bright Satellites of Uranus. (Nos. II. and IV. of Herschel I.)

Observations by Mr. Lassell, with the 20-foot Equatoreal Reflector.

		Greenwich M.T.	Position.	Distance.	Obs.
1849.		h m s	° ′	″	
Nov. 15	IV.	11 13 30·5	3 29		3
	IV.	58 52·3		45·24	3
	II.	11 26 1·5	293 32		3
	II.	51 52·2		23·50	3

Occultations of Stars by the Moon observed at Ashurst (51° 15′ 58″ N. lat., $0^h\ 1^m\ 10^s$ W. long.) By Mr. Snow.

			Ashurst M.T.		
1849			h m s		
Dec. 3	33 Ceti	Imm.	4 58 12·0	Dark L.	not certain.
27	1526 B.A.C.	Imm.	4 56 58·3	Dark L.	very good.
1850.					
Mar. 27	γ Virginis, 1st star	Imm.	12 49 47·5	Bright L.	
	2d star	Imm.	51·5	—	contact.
		—	52·5	—	disappearance.
	Both stars	Em.	14 0 5·5	2d L.	

The stars emerged simultaneously.*

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* Mr. Snow gives a diagram of the occultation, and states the angle of position of the double star to be, roughly, 177°·5, and the distance about 3″.

"Both of the stars composing the double star *γ Virginis*, at immersion as well as at emersion, disappeared and reappeared slowly, like planetary bodies. In the case of the first star (the one of the two components that first reached the moon's limb), I am not sure whether I noted down its first contact or its final disappearance. But, as also was the case with its companion star, it occupied about 1ˢ, or a little longer, in disappearing: not that the stars merely *clung* to the moon's limb, and then suddenly disappeared, but they disappeared *gradually;* and at one instant were seen fairly dichotomised, just as would have been the case with a planetary disk. In the case of the second star, both its first contact with the moon's limb, as well as its final disappearance, was noted, as above, and presented phenomena of *gradual disappearance*, precisely similar to those presented by the first star. Beyond this, neither star, at immersion or at emersion, was seen to suffer the slightest change either of colour or magnitude; and the absolute equality of the two components was throughout very striking. The instrument used was the 5-foot equatoreal, with clock-work movement, &c. The power employed was 245, which separated the stars very beautifully: so fine was the night, that with this power the limb of the full moon was singularly well defined and steady. The stars emerged nearly together, the line joining their centres being nearly a tangent to the moon's limb; and they reappeared in *contact* with the edge of the *illuminated* portion of the disk. The moon had passed her full, though only by 2ʰ. The night was frosty, perfectly serene and calm, with admirable definition; and every circumstance as favourable as possible during this most interesting occultation.

"I was carefully on the watch on the 15th and 16th of April for the occultations of *Aldebaran* and of 119 and 120 *Tauri*, but was completely baffled by the bad weather."

Observations of γ Virginis. By Mr. Hartnup, with the Liverpool 8½-inch Equatoreal Achromatic.

Parallel Wire Micrometer; Power 288.

Epoch.	Position.	Weight.	Distance.	Weight.	No. Obs.
	° ′		″		
1850·299	177 9	6	2·82	6	10
1850·302	176 8	3	3·02	3	10
1850·310	175 53	6	2·94	6	10
1850·304	176 26	15	2·91	15	30

Double-image Micrometer; Power 261.

1850·292	178 13	4	2·80	4	10
1850·299	178 57	5	2·91	5	10
1850·302	178 33	3	2·93	3	10
1850·298	178 36	12	2·88	12	30

"I get my zero for angles of position with the divided eye-piece from a mean of several stars. This agrees very nearly with the zero from γ *Virginis*. An observation with the divided eye-glass is the mean of two readings, either in position or distance, taken in contrary separation of the images. The weights are estimations depending on the perception of the observer, the fineness of the night, the consciousness of being successful or not," &c.

Extract of a Letter from Prof. Weisse to Col. Sabine, relating to the Continuation of the Reduction of the Observations of the Stars in Bessel's Zones.

"On astronomy I cannot say much; the sky has been throughout the past winter very unfavourable for observations; weeks were frequently passed without a star being seen. You are aware that I have determined to work up the remaining zones of Bessel from $+15°$ to $+45°$. This is a very laborious work, which requires much time and an enormous amount of patience, all the more that I am confined to my own personal labour, even for the minutest details. I have been urged to the work from many quarters. I thought seriously for some time whether I should or should not undertake a labour which will require for many years the whole of the time which is left to me from my other avocations. The diligent use which has been made by astronomers of the first part of my catalogue has induced me to take the matter in hand. In order that the work may come the sooner into the hands of astronomers, it will be divided into four parts, each of which will contain six hours of right ascension. Some days since I entered the last stars of the first six hours in the catalogue. The precessions, taken out of my own special tables, are still to be added for the fourth and fifth hours, and the first volume will then be finished. If my life should be spared, and especially sufficient rest of mind for so serious a work, I hope to be able to bring it to a termination. I may, in addition, remark, that this time the shape and printing will be altogether different from those of the first catalogue."

Brief Description of a small Equatoreal and Dome at Tarn Bank, near Cockermouth. By Isaac Fletcher, F.R.A.S.

"Towards the close of the year 1847, I purchased from Thomas Cooke, of Coney Street, York, a 6-foot achromatic refractor, having a clear aperture of 4·14 inches, and mounted on a portable equatoreal stand constructed somewhat in the German style. A little experience in the use of this instrument convinced me of its excellent quality, and consequently I determined to erect an observatory to place it in, in order to give it full efficiency. The mounting being deemed not sufficiently stable and firm for a fixed instrument, an entirely new one with clock-work motion was ordered, and whilst these were in progress the observatory was erected.

"Owing to local obstruction, it was necessary that the floor of the observatory should be raised a considerable height above the surface of the ground. Accordingly, an octagonal stone tower, 18 feet in height and 14 feet diameter outside, was erected, on the walls of which a massive coping-stone was placed. On this coping-stone a circular building of brick is erected, $6\frac{1}{2}$ feet in height, the walls of which are 9 inches thick. The internal diameter of this building (which constitutes the *observatory*) is 11 feet 3 inches, and the entrance into it is by means of a door in the floor, to which a staircase in the octagonal part of the building leads. The floor is 12 inches above the commencement of the circular brickwork, and is of wood. Across the centre of the floor, and in the direction of the astronomical meridian, are laid two massive beams of American pine timber, 12 inches square. These beams are placed close together *below* the boarding of the floor, of which they are entirely independent, not being in contact in any part whatever. On each end of the beams is raised a heavy piece of brickwork and Roman cement. The south pier is capped by a large block of sandstone, weighing about 5 cwt. This stone supports a small casting, in which is placed a small block of lignum vitæ, in which the lower pivot of the polar axis turns. On the north pier a stone column is placed, which bears on its summit a framing of cast-iron, to which the adjustments are attached for supporting the upper pivot of the polar axis. On the top of the circular wall a ring of wood is firmly fixed, to which is screwed the cast-iron channel in which the 3 four-inch balls rest, on which the dome revolves. Both the upper and lower rings are cast in one *entire* piece, and are beautiful specimens of loam casting.

"The dome is a perfect hemisphere, and is formed of a number of vertical ribs of the requisite curvature, $4\frac{1}{2}$ inches broad and $1\frac{1}{2}$ inch thick, which radiate from a large block of wood at the vertex of the dome. This framework is covered by $1\frac{1}{2}$-inch pine boarding, covered with canvass, and painted and sanded in the manner described by the Rev. W. R. Dawes, F.R.A.S., in his description of the Camden Lodge Observatory. (See *Mem. Roy. Astron. Soc.*, vol. xvi. p. 323.) The shutters of the roof-opening are of sheet-iron, bent to the curvature of the dome; they are two in number, and, when open, lay back against the dome.

"The telescope is mounted on a long polar axis, similar in principle to those adopted by Dollond in most of his equatoreals. The tube is placed on *one side* of the polar axis, to the opposite side of which a leaden counterpoise is screwed. The polar axis is of mahogany, and is 9 feet long, 7 inches square at each end, and 9 inches square at the middle. The hour and declination circles are each 20 inches in diameter; they are divided on silver, and read by verniers, the former to 2^s of time, and the latter to $10''$ of space.

"The driving clock is a very elegant piece of workmanship, and performs its work with singular smoothness and regularity. The regulation is effected by means of a *governor*, precisely similar to

those used in steam-engines, the extra power being absorbed by a brass friction-wheel.

"There are seven negative eye-pieces attached to the telescope, the powers of which vary from 45 to 350, and two single lenses of 400 and 500 respectively.

"The positive eye-pieces of the micrometer are six in number, the powers of which vary from 50 to 420.

"The position-circle of the micrometer is divided on silver, and reads by two opposite verniers to single minutes of space. The heads of the screw are each divided into 100 parts, and by careful estimation each division may be subdivided into 5ths or 10ths.

"As evidence of the quality of the object-glass, it may be added that I can readily see the two companions of τ *Orionis*, one of which is rated by Captain Smyth as of the 15th mag., Herschel's '*debilissima*' couple between ε and 5 *Lyræ*. I have also frequently seen, and under rare atmospheric circumstances, have caught up, the *5th star* in the great nebula of *Orion*. The star 36 *Andromedæ*, the separation of which Sir J. Herschel adduces as a proof of the excellence of his celebrated 7-foot achromatic of 5 *inches aperture*, I have seen with power 400 completely severed.

"Both the building and the mounting of the instrument are remarkably firm and steady.

"The whole of the workmanship of this equatoreal, both optical and mechanical, is by Mr. Cooke, upon whom it reflects great credit.

"It is proposed to devote this instrument to an examination of a selected list of double stars, taken from Smyth's admirable '*Cycle*.'"

Note by Mr. Dawes, to his late Paper, "On the Phenomena attending the Disappearance of Saturn's Ring."

"In my paper lately presented to the Society, 'On the Phenomena attending the Disappearance of *Saturn's* Ring,' I have stated that the brightest points visible on the obscure surface of the ring, namely, the eastern and western extremities, receive reflected light from *one-half only* of the illuminated surface of *Saturn*, which would be seen from them as a *half moon*.

"Soon after that paper was sent, it occurred to me that, as the plane of the ring coincides with the planet's equator, the parts of the ring in question would receive reflected light from *one quarter only* of *Saturn's* illuminated hemisphere, which would be seen from them as *the northern or the southern half of a half moon*. The *base* of this illuminated quadrant would appear *in the horizon;* and the angle subtended by it in *azimuth*, as seen from the exterior portion of the inner ring, would be about $27\frac{1}{2}$ degrees; while, in consequence of the oblateness of *Saturn's* form, the *altitude* of the quadrant will be only about 25 degrees.

" This consideration greatly diminishes the probability of the reflected light received from *Saturn* by the extremities of the ring being sufficient to render its obscure surface so bright, that portions of it should rival the satellites themselves in brilliance, and proportionably increases the force of the argument in favour of a twilight produced by refraction of the solar rays.

" Respecting the invisibility of the *edge* of *Saturn's* ring, the testimony of Sir John Herschel is of great importance. In his *Outlines of Astronomy*, page 316, *note*, he says, ' Its disappearance was *complete* when observed with a reflector 18 inches in aperture, and 20 feet in focal length, on the 29th of April, 1833, by the author.'

" In my quotation on this subject from Sir W. Herschel, an erratum occurs in page 50, line 35, of the printed *Monthly Notices*, vol. x.; where, for ' any telescopes,' read ' my telescopes.' "

Error in the Histoire Céleste. By the President.

The star Lalande 11946, as named in Lalande's Catalogue published by the British Association, appears, on the authority of Mr. Maclear, to be 1^m in error in right ascension.

Mr. Maclear has observed with the equatoreal all the stars in the immediate neighbourhood, and finds the following :—

R.A.	N.P.D.	Mag.
h m s	° ′ ″	
6 7 35	64 27 50	9
6 9 25	64 25 8	7½
6 9 26	64 29 55	9½
6 9 26	64 36 10	8½

Now Lalande 11946, reduced with sufficient accuracy to the beginning of the present year, 1850, gives,

R.A.	N.P.D.
$6^h\ 8^m\ 39^s$	$64°\ 27'\ 44''$,

which agrees pretty well with the first of the above list, on the supposition that Lalande's R.A. is too great by 1^m.

Again, the second of Maclear's list differs from the first by $1^m\ 50^s$, and Lalande 11946 differs from 11977 (observed in sequence on the same evening) by $0^m\ 50^s$; and, the second of Maclear being undoubtedly identical with No. 11977, it thus appears also that No. 11946 is in error 1^m in excess.

Lastly, it would appear that Lalande 11975 is identical with 11977, and 11976 with 11978.

Notes on the British Association Catalogue. By Capt. W. S. Jacob, Director of the H. E. I. C.'s Observatory at Madras.

The undermentioned numbers have not been found in the places indicated :—

	R.A.	N.P.D.
No. 90		
434		
	h m s	° ′
534	There is a star at 1 37 30	and 141 22
642	,, 1 57 33	,, 143 45
969		

1088 is perhaps a duplicate of 1086, with error of 30′

3401 There is ✱ 9 m. at $9^h\,49^m\,45^s$ 134° 14′

3535 Perhaps a duplicate of 3541, 30^s out in R.A.

4144 ,, 4146, 10^s ,,

7264 ,, 7265, 1° out in N.P.D.

"The Nos. 719, 2511, 2766, marked as nebulæ, appear in our transit (5 ft. focal length, and $3\frac{1}{2}$ in. aperture) as loose clusters of small stars. Of course these may be nebulæ not visible in our instrument.

"No. 2511 contains a small double star, which has been observed.

"Nos. 1728 and 1999 are double."

Mr. Hind says, "I discovered on the 4th of January last a rather conspicuous nebula, the position of which for 1850 is—

R.A. $12^h\,0^m\,33^s{\cdot}16$. N.P.D. 23° 59′ 30″·1.

"It is elliptical, and has a decided nuclear condensation.

"In October, 1845, I found a highly-coloured crimson, or even scarlet, star in *Orion*, far the most deeply coloured object I have yet seen. Its mean place for 1850 is—

R.A. $4^h\,52^m\,46^s{\cdot}76$. N.P.D. 105° 2′ 9″·3."

Mr. Fletcher sends the following remarks on the brightness of *Pollux* :—

"In the *Celestial Cycle* Captain Smyth remarks, 'This star has been suspected of varying in lustre, since it is recorded as having at times been *brighter* than *Castor*, whence Bradley rated it of the first magnitude; others have classed it of the 3d rank; but Ptolemy, Tycho, Lacaille, Zach, and all the best authorities classify it as of the 2d.'

"At the moment I am writing *Pollux* is obviously and unmistakably brighter than *Castor*, and I think it brighter, at any rate *fully* as bright, as *α Ursæ Majoris*. How long it may have been so I am unable to say, and can only speak of the present appearance."

Extract of a note from Mr. G. S. Spreckley, of Shang Hai, to *the Secretary, respecting η Argûs.*

"On my voyage from Suez to Penang, my attention was excited by the unexpected splendour of *η Argûs*, which is now a large first magnitude, surpassing every other star in the constellation except *Canopus*. . . . Seen with the naked eye, or with a glass, there was a manifest difference in colour between the rays of light from its SW. and from its NE. position, the former being brilliant red, and the latter a bluish green. Is it a double star?"

Dr. Forster calls attention to the simultaneous phenomena of numerous solar spots and unusual cold, which have occurred since March 18th. It is remarkable, that during the nights of severest cold the wind has blown from the south and south-east, which is to be viewed in connexion with the extraordinary cold felt in the Levant, and particularly at Constantinople, during the present spring.

Discovery of a Comet at Altona.

Professor Schumacher has sent the following particulars of a faint telescopic comet discovered at the Observatory of Altona by Dr. Petersen:—

	Altona M.T.	R.A.	Decl.	
		h m s	° ′ ″	
May 1	10 0 0	19 25 0	+71 10 0	approximate.
2	11 0 0	19 24 7·9	+17 19 34	

Hourly Change in R.A. = −2ˢ; in Declin. = +20″.

Errors in Captain Shortrede's Table of Logarithms to Numbers.
By Mr. Galbraith.

Page 31	log. to 24451	*for* 3882996	*read* 3882966
43	38962	5906413	5906412
50	parts	729	728
56	54033	7326541	7326591
59	57628	7606336	7606335
59	57629	7606410	7606411
64	63747	8044597	8044598
81	85071	9296815	9297815
93	99286	9968800	9968880

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